



THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

A. M. E. C. E. A

MAIN EXAMINATION

JANUARY – APRIL 2018 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE

REGULAR PROGRAMME

CMT 310: OBJECT ORIENTED SYSTEMS ANALYSIS AND DESIGN

Date: APRIL 2018

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

- Q1. a) Explain the Object-Oriented paradigm **(2 Marks)**
- b) Explain the following principles of Object Oriented paradigm (8 Marks)
- i) Inheritance
 - ii) Encapsulation
 - iii) Polymorphism
 - iv) Abstraction
- c) What do you understand by cardinality of a relationship **(2 Marks)**
- d) Explain THREE levels of testing in Object Oriented systems **(6 Marks)**
- e) Represent the following information regarding a banking system using a use-case diagram **(4 Marks)**
- i) A bank customer withdraws money
 - ii) A bank customer deposits money
 - iii) Bank teller verifies customer withdrawal slip
 - iv) Bank manager approves loan application
- f) Create a Java class for the following class diagram **(5 Marks)**

Circle
- x-coord - y-coord # radius
+ findArea() + findCircumference() + scale()

- g) Give THREE advantages of object-oriented databases as compared to relational databases **(3 Marks)**
- Q2. a) Explain any **THREE** cardinality ratios of associations between objects **(6 Marks)**
- b) Explain TWO types of hierarchies in object-oriented systems **(4 Marks)**
- c) Give the advantages and disadvantages of Data Flow Diagrams as used in object-oriented modelling. **(6 Marks)**
- e) Explain the relationship between Object Model and Dynamic model in object-oriented systems. **(4 Marks)**
- Q3. a) Explain with examples FOUR types of relationships used in UML diagrams to model object-oriented systems. **(8 Marks)**
- b) Represent the following in UML diagrams to depict modelling of object-oriented systems **(8 Marks)**
- Collaboration Diagram
 - State Chart Diagram
 - Activity Diagram
 - Component Diagram
- c) Using a diagram, name components of a use-case diagram **(4 Marks)**
- Q4. a) Explain the following testing categories of object-oriented systems testing **(6 Marks)**
- Alpha testing

- ii) Beta testing
 - iii) Acceptance testing
 - b) Explain FIVE software quality factors in relation to object-oriented systems **(10 Marks)**
 - c) Explain the following terms as used in relation to object-oriented systems **(4 Marks)**
 - i) Software Quality
 - ii) Quality Assurance
- Q5.
- a) Explain FIVE advantages of object-oriented database systems over relational databases **(10 Marks)**
 - b) Give FOUR examples of object-oriented operating systems **(4 Marks)**
 - c) Explain any THREE implementation details of Object Design in Object Oriented Systems **(6 Marks)**

END